

Claims

1. A radio communication method including a first channel through which a first radio communication device and a second radio communication device perform data communication and which is in a sleep mode at an initial stage, and also a second channel in which communication is possible at all times and with lower power consumption than the first channel, comprising:

a step in which the first radio communication device transmits control information to the second radio communication device in the second channel;

a step in which the second radio communication device receives the control information in the second channel and puts the first channel in a data reception operating mode; and

a step in which after transmission and reception of data are performed in the first channel between the first radio communication device and the second radio communication device, the first channel signal reception is returned to the sleep mode.

2. The radio communication method according to claim 1, wherein both the first radio communication device and the second radio communication device are UWB radio communication devices, and in which the first channel is a wideband transmission channel and the second channel is a narrowband transmission channel whose modulation and demodulation rates

are set to be less than or equal to a predetermined value.

3. The radio communication method according to claim 1, wherein the control information further includes communication time reservation request information in which a time slot when data transmission will be performed is written, further comprising:

a step in which if the communication time reservation request information included in the received control information is addressed to the second radio communication device, in the second channel it transmits communication time reservation response information in which information notifying that communication reservation addressed to the second radio communication device has been received is added to the communication time reservation request information;

a step in which a third radio communication device located in an area where communication is possible with the first radio communication device or the second radio communication device or both receives the communication time reservation request information from the first radio communication device or the communication time reservation response information from the second radio communication device or both in the second channel, and stores the time slot written in the communication time reservation request information or the communication time reservation response information as a transmission prohibition time slot; and

a step in which the third radio communication device decides a time slot in which its own transmission and reception are possible, based on the stored time slots of transmission prohibition, and

wherein the first radio communication device transmits data using the second channel in the time slot designated by the communication time reservation request information .

4. The radio communication method according to claim 1, further comprising:

a step in which the second radio communication device requests the first radio communication device to transmit communication time reservation request information using the second channel, and

wherein the first radio communication device transmits the control information in response to the request from the second radio communication device in either the first channel or the second channel.

5. The radio communication method according to claim 1, wherein the first radio communication device further performs multicasting to the second radio communication device in the second channel.

6. A receiver, comprising:

a first receiving unit receiving a preamble in a narrowband channel in which reception is always possible;

a second receiving unit receiving data in an UWB channel,

and which can save power; and

a communication data selection unit controlling the power saving in said second receiving unit in the case where the communication data selection unit receives the preamble from said first receiving unit, and

wherein said communication data selection unit puts said second receiving unit in a power saving mode, and when said communication data selection unit receives the preamble from said first receiving unit, said communication data selection unit cancels the power saving mode in said second receiving unit and conducts reception of data in the UWB channel.

7. A receiver, comprising:

a first receiving unit receiving control information in a narrowband channel in which reception is always possible;

a second receiving unit which receives data in an UWB channel, and which can save power; and

a communication data selection unit controlling the power saving in said second receiving unit by judging whether the control information received by said first receiving unit is addressed to that receiver or not, and

wherein said communication data selection unit puts said second receiving unit in a power saving mode, and cancels the power saving in said second receiving unit when said communication data selection unit receives control information addressed to said communication data selection

unit from said first receiving unit to receive data in the UWB channel.

8. A transmitter, comprising:

..... a control information pulse generation unit outputting control information in pulses having a wide pulse width;

a data pulse generation unit outputting transmission data in pulses having a narrower pulse width than the width of pulses output by said control information pulse generation unit;

an oscillator outputting an oscillation signal corresponding to the pulse width of the pulses inputted from said control information pulse generation unit and from said data pulse generation unit; and

a transmitting unit transmitting the signal outputted from said oscillator, and

wherein said oscillator switches between output bands, outputting a signal in a narrowband channel when there is a pulse input from said control information pulse generation unit, or by outputting a signal in an UWB channel when there is a pulse input from said data pulse generation unit.

9. A radio communication device comprising:

a receiver which has a first receiving unit which receives control information in a narrowband channel and where reception is always possible, a second receiving unit which receives data in an UWB channel, and which can save power, and

a communication data selection unit controlling power saving in the second receiving unit by judging whether the control information received by the first receiving unit is addressed to that receiver or not, in which the communication data selection unit puts the second receiving unit in a power saving mode, and when the control information addressed to that receiver is received from the first receiving unit cancels the power saving mode in the second receiving unit and conducts reception of data in the UWB channel, and

a transmitter which has a control information pulse generation unit outputting control information in pulses having a wide pulse width, a data pulse generation unit outputting transmission data in pulses having a narrower pulse width than the width of the pulses output by the control information pulse generation unit, an oscillator outputting an oscillation signal according to the pulse width of the pulses inputted from the control information pulse generation unit and from the data pulse generation unit, and a transmitting unit transmitting the signal outputted from the oscillator, in which the oscillator switches between output bands, outputting a signal of a narrowband channel when there is a pulse input from the control information pulse generation unit, or outputting a signal in an UWB channel when there is a pulse input from the data pulse generation unit.

10. The radio communication device according to claim 9,

wherein the control information includes communication time reservation request information in which a time slot in which a source radio communication device will transmit data is written,

wherein said receiver further comprises;

a communication information analysis unit which extracts an identifier of the source radio communication device and the reserved time slot for data transmission from the communication time reservation request information ;

a communication reservation table in which said communication information analysis unit records the identifier and the reserved time slot, linking them with each other, when the destination of the control information is that receiver; and

a response information generation unit which generates communication time reservation response information in which information for notifying proper reception is added to the communication time reservation request information, and

wherein the control information pulse generation unit of the transmitter generates a pulse based on the communication time reservation response information generated by said response information generation unit and the oscillator generates a signal of the narrowband channel according to the pulse.

11. The radio communication device according to claim 10,

wherein the communication data selection unit allows information to be receivable in the UWB channel only in the reserved time slot of data transmission addressed to the radio communication device.

12. The radio communication device according to claim 9, wherein the narrowband channel is a channel in which modulation and demodulation rates are set to be less than or equal to a predetermined value.